Scientific American.

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Rail Road News.

St. Louis Pacific Railroad.

The Republican gives the amount of subscriptions, as far as known, at $434,000, and says that it is thought that there are other subscriptions not yet returned by the canvassing committees, which may swell the amount to $500,000.

Mobile and Ohio Railroad.

On the 27th ult. an election of the people was held at Mobile, to decide whether the corporate authorities of that city should subscribe $300,000 to the stock of the Mobile and Ohio Railroad, the sum to be raised by levying a tax on the real estate of the city.

The Ogdensburg, N. Y., Railroad, has executed a mortgage of its property, for the benefit of all its bond-holders. The trustees are, James Savage, J. J. Dixwell, of Boston, and G. N. Seymour, of Ogdensburg. The road will be finished in all, next fall; it has been built at small cost, in consequence of the favorableness of the grade.

A locomotive exploded on the Troy and Schenectady Railroad on the 11th inst. The engineer, W. Wigins, was killed. It was a comparatively new engine, built by Norris.

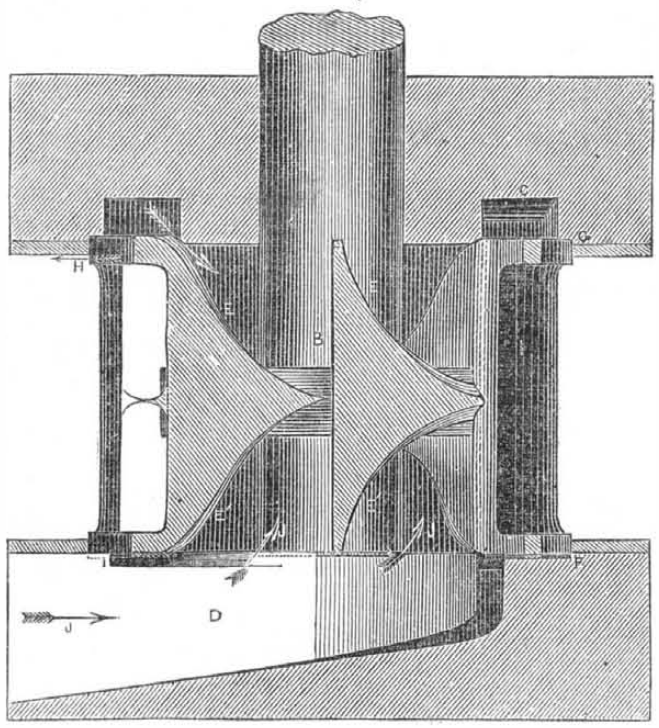
The Lowell, Mass. Railroad, for the last eleven years, has netted 8 per cent dividends every year.

In Pensacola, Florida, $200,000 has been subscribed, for a railroad, from that place to Montgomery, Alabama.

Lake Nicaragua.

Lake Nicaragua is described as a magnificient stream, and scenery on its borders is remarkable for beauty. The banks near the sea are low, and are covered with palms, which look like so many giant plumes. Higher up, the banks are more elevated, and covered with a dense mass of verdure, coming down like a wall to the very edge of the water. These are broad leaved plantain, the gigantic cebia, the slender cocoa palm, besides an hundred other strange varieties, twined and bound together with vines, covered with bright flowers, and hanging their long pliant tendrills from every stem. On this mass of impenetrable verdure, which never fades, parrots and noisy macaws glance in and out; long neck cranes mounted on the sandbars; bright green inguanas looked down from the overhanging limbs, and queer monkeys hang by their tails and chatter vociferously. The lake Nicaragua, is a remarkable fine body of water; nearly as large as lake Ontario. On the north, are the undulating slopes grassy hills of Chartales, the paradise of the cattle raisers—on the south, for a long distance, are the rugged hills towards Costa Rica, the abode of the untamed Indians; the fine department of Nicaragua, lately the seat of terrible commotions; the department of Grenada, with its indigo and cocoa estates and its volcanic peaks. In the midst of the lakes rises the regular cone of Ometne, a very fine mountain, and by its side the volcano of Maderia, capped with clouds.

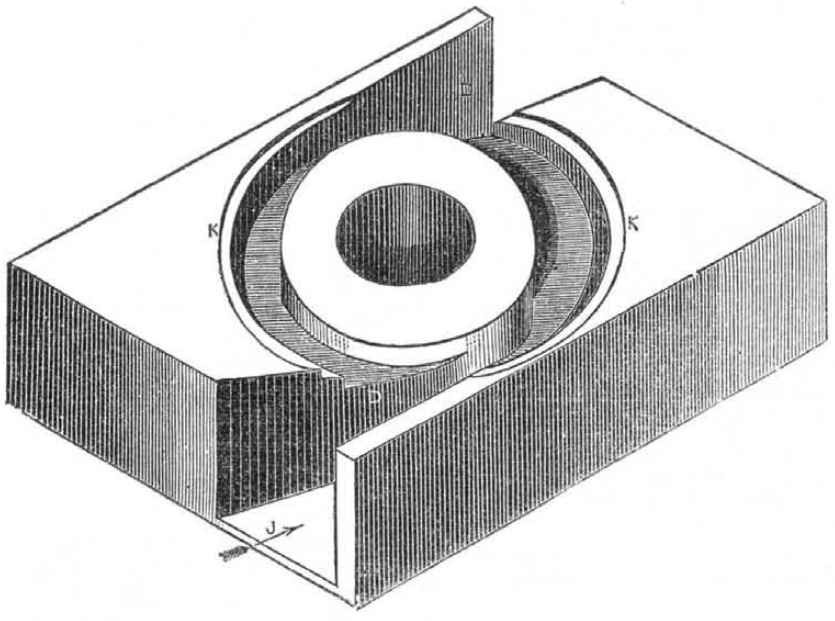
IMPROVEMENT IN WATER WHEELS.---Fig. 1.



This improvement on Water Wheels is the invention of Mr. W. T. Collier, of Old Fort, McDowell Co., N. C. The wheel is a double acting submerged one, employing the re-active force of the water.

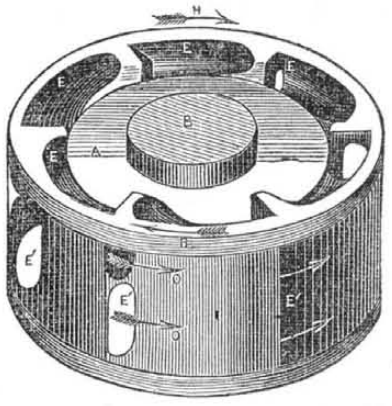
Figure 1 is an inside view, with the outer casing removed. Fig. 2 is a plan of the lower shute. Fig. 3 is a perspective view of the Wheel. The arrows indicate the direction and motion of the water, and will serve to give a clear view of its action. The same letters refer to like parts on the three figures.

Figure 2.



The wheel has two set of buckets, one above and one below, set at opposite angles but discharging in the same direction, and each set

FIG. 3.



is supplied by a separate water draft or shute. The pressure below counteracts the pressure above, to balance and poise the wheel shaft truly, at all times—a very important consideration, especially in grist mills. A is the end of the wheel; B is the shaft; E E— are the upper tier of buckets, and E1 E1— the lower tier; D is the lower water shute. The upper one, C, is of the same construction. The arrows, J J, represents the entering water, and O O the discharges; H H, shows the direction of the wheel's motion. The shutes are capable of receiving and conducting the water at either end. The shaft passes through proper guide boxes in the shutes. The wheel fits snugly into the case, K K, and is fitted to run freely, but snugly in it, as represented by the letters, G P, fig. 1.

The construction of this wheel is so simple, and its operation is so well defined by the arrows, that it requires no farther description either of its construction or operation. It may be made of wood or cast iron, or a combination of these materials. The manner of its operation removes the friction from the lower step or bearing, thus making the wheel shaft more durable, less liable to breakage, makes it run more steady, and consequently its working power is greatly increased. With a low head and plenty of water, re-action wheels are by far the best, and have been the means of extending all kinds of manufactories throughout our country, by their peculiar adaptation to the propelling of machinery, in situations unfavorable to other kinds of wheels. Every improvement in prime motors, such as water wheels and steam engines, is of incalculable benefit to mankind. A small improvement in the water-wheel and steam engine confers more direct benefit upon mankind than the invention, in toto, of many new machines. An invention that would save three per cent on a steam engine, would save millions in the aggregate, to the whole country. We therefore welcome the smallest improvement in a prime motor, as a great improvement. Mr. Collier has applied for a patent. Information respecting his wheel may be obtained by letter (*p. p.*) addressed to him, as above mentioned.

Useful Receipts.

Cure for Stammering.

At a recent meeting of the Boston Society of Natural History, Dr. Warren stated a simple, easy, and effectual cure of stammering, which is known to be generally a mental, and not a physical defect. It is, simply, at every syllable pronounced to tap at the same time with the finger; by so doing, the most inveterate stammerer will be surprised to find that he can pronounce quite fluently, and by long and constant practice he will pronounce perfectly well. Dr. Warren said that this may be explained two ways—either by a sympathetic and consentaneous action of the nerves of voluntary motion in the finger, and in those of the tongue, which is the most probable. We know, as Dr. Gould remarked, that a stammerer who cannot speak a sentence in his usual way, can articulate perfectly well when he introduces a rhymatical movement, and sings it,—or it may be that the movement of the finger distracts the attention of the individual from his speech, and allows a free action of the nerves concerned in articulation.

[It is well known that some men who cannot speak a single sentence without stammering, will recite pieces which they have committed to memory, with grace and the utmost correctness. Stammerers sing correctly and talk tolerably well, the most of them when describing cooly, something with which they are familiar. When excited or abashed, the plague of stammering is then painfully manifest; with some it is a natural defect—with some it is an acquired habit. The latter can be cured with self-culture, studying not to think what they shall say, but calmly, how to say it. A stammerer is generally quick of thought, with his mind ahead of his tongue; it therefore requires great discipline to cure such a habit in him; but it appears to be reasonable, that those who stammer from a sympathetic habit merely, can be cured.

So perfect were the Egyptians in the manufacture of perfumes, that some of their ancient ointment, preserved in an alabaster vase in the museum in Alnwick, still retains a very powerful odor, though it must be between 2,000 and 3,000 years old.

A piece of Lead Ore, weighing 1,500 lbs., was recently received at New Orleans form Arkansas. The ore is said to yield 120 ounces of silver to the ton.

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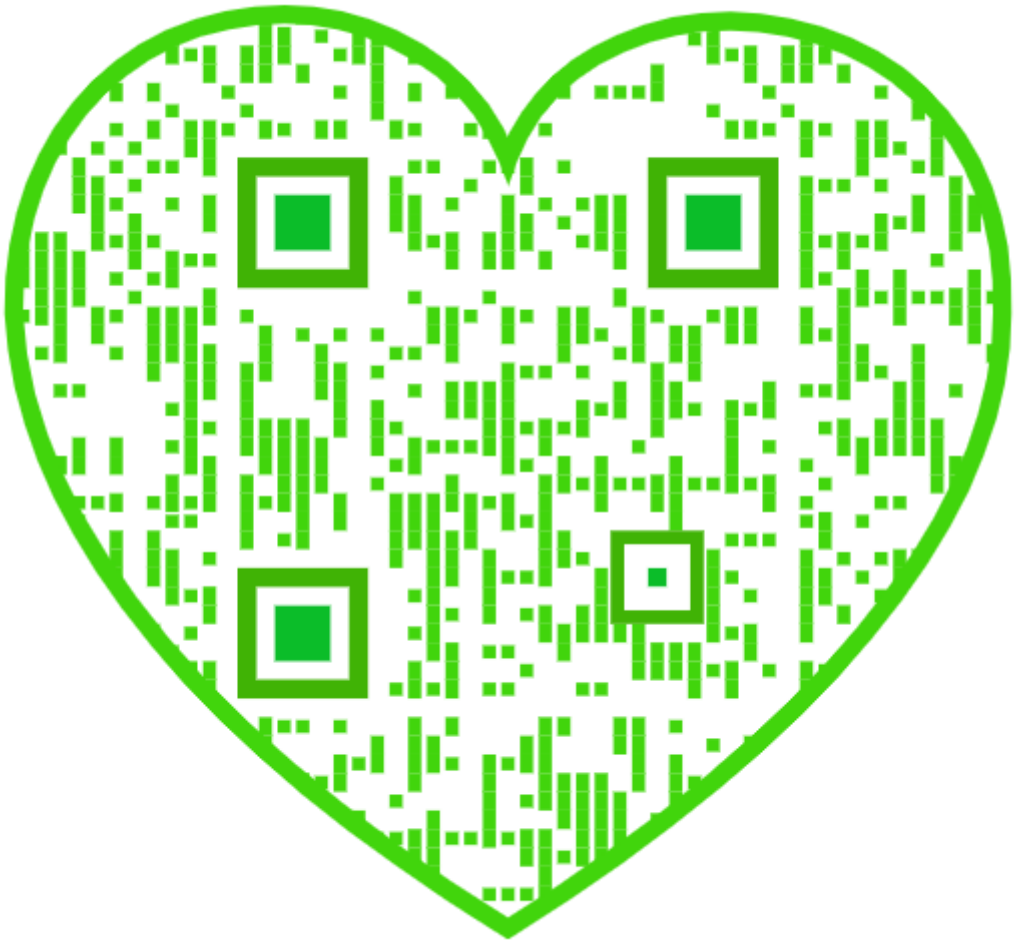

Miscellaneous.

Correspondence of the Scientific American.

WASHINGTON CITY, March 12, 1850.

The Senate Committe on Patents will, in a few days, make a favorable report on the resolution referred to them, providing for such an alteration in the Patent Laws, as shall require public notice to be given before any application for the renewal of a patent shall be entertained in Congress, or by the Commissioner of Patents. Hence, in case of such a regulation, petitions against as well as for renewals, will be received simultaneously, and no unfair advantage over industrious mechanics can be obtained.

The idea in your last number of having an American World's Convention for the exhibition of works of mechanical skill, is highly approved in this section. I called the attention of several members of Congress to it, and they are of opinion that such a movement could not fail of success. It would be a glorious thing for the mechanics of this country, as very few foreign countries have any idea of their American skill. The question is then settled. Shall we make the first movement here, or will you do it in New York?

The statement that Capt. Colby, of New Bedford, Mass., has a bed cord made of whale's sinews, which has been used by the family over 200 years, has, I see, stirred up the faculties of a Virginia planter, who asks with enthusiasm, "why is not that the right kind of stuff for a suspension bridge?"

Our canal having been recently drained, yesterday a large quantity of resinous sediment from the new Gas Works emptied itself through the drain beneath the bank and spread over the surface of the mud. This being accidentally ignited, threw up such an immense volume of black smoke that it alarmed the whole city. It was a grand spectacle.

M. R. Mills, of this city, has been appointed Architect for the Virginia Monument of Washington, and Crawford, the sculptor, is going to Italy to execute a portion of the work.

A few days ago Gov. Seward presented the President with a silver currycomb, sent on by a manufacturer of those articles in your city. Some Yankee will, I presume, soon send on some silver oats for the horse; that is, if there is any chance of said oats being, by the process of digestion, transformed into a good fat office.

From conversation with several Senators, I think there is no doubt but that the act of July 8, 1845, granting a renewal of the Woodworth patent for the planing machine, will be repealed. From the facts stated in the various memorials on the subject, the Committee on Patents feel indignant, and they say that Congress has unwittingly been made the instrument of creating a monopoly and imposing a tax on the industrious mechanic.

Your remarks in relation to the unjust appropriation of the Patent Fund for the erection of buildings not connected with the Patent Office, have caused a strong feeling among the members, who naturally ask why the surplus fund is not expended in publishing a history of all the patents ever granted, so that ingenius men, on coming here with inventions, may no longer be heart-broken at finding they have been anticipated.

Lieut. Davis has been delivering some interesting lectures at the Smithsonian Institute on the "Tides of the Ocean."

J. Johnson, of Saratoga street, Baltimore, offers to erect fire-proof rooms for the Departments at a low rate. He offers to furnish iron floors and pillars to support them at two cents a pound, wrought iron joints at three cents, and wooden sash and frames of the same material, at four cents.

A French sportsman has sent an interesting article to the "Intelligencer," in which he demonstrates that since the introduction of percussion caps it is much safer to carry a gun or pistol at half-cock than according to the present mode of leaving the hammer on the cap.

*

Woodworth Patent.--Important Decision.

U. S. Circuit Court—In Chancerry—Elisha Bloomer vs. Curtius and Rinne.—Complainant applied for an injunction to restrain the defendants from using Woodworth's Planing Machine. The defendants for answer say that they had bought the right under the first extension of the patent, and that therefore they are entitled to the benefit of the second extension, if not in whole, at least until their machines are worn out. The patent was taken out about 1827, and expired in 1842. In 1836 it was extended by Congress till 1849. The extension, however, contained a saving clause in favor of the assignees, which the Supreme Court has construed, gives the purchasers the right to use their machines till worn out. The act of 1845 gives additional extension till 1856 but contains no saving clause. The defendants purchased under the first extension. The Court have decided that the second extension, containing no saving clause in favor of assignees, they have no right to the use of the patent machine. The reasoning of the Supreme Court in the case of Wilson vs. Simpson, which which gave a construction to the saving clause, seems conclusive in this case. There it was held that the insertion of the words secured the right of using the machine till worn out. The absence of those words in the act of 1845, consequently deprives defendants of the right. Injunction allowed.—New Orleans Crescent, 24th ult.

[On the 5th inst., in the Senate, U. S., numerous petitions were presented as remonstrances against the renewal of the Woodworth Patent. An application being made for that purpose, Mr. Dawson stated in the course of a few remarks, in relation to the said petition, that the Committee of patents had decided against a renewal of the Patent. In the Sci. Am. of the 2nd. (penned at least 8 days before the above statements were made) we made this remark, "from peculiar information in our possession, we believe, the renewal of the Patent will be denied." It is seldom that we are wrong in our conclusions respecting such things.

Mississippi Wine.

Mr. J. Noyes, residing near Natchez, has manufactured a wine that, on account of its excellence, is begining to attract considerable attention. The editor of the Jackson Southron says:

"Last Saturday, in company with a few others, we participated in tasting some specimens of wine made from grape, cultivated by J. Noyes, at Hollywood, near Natchez, Mississippi, and were gratified that this new and important branch of domestic industry has been brought to such a high state of perfection among us; and that a species of wine, partaking largely of the character of the famous Tokay, may be successfully cultivated within our borders. The greatest difficulty in cultivating in this latitude the Catawba, Isabella and other common grapes of the country, arises from the humidity of the climate, which rots or causes them to die out or degenerate in two or three years. This fatal impediment to success in vine-growing is entirely avoided by planting the Roanoke grape, so successfully tested and improved upon, for a number of years, by Mr. Noyes, and which he has found peculiarly suited to our soil and climate. It is said the Roanoke grape resembles the Scuppernong grape, but we understand from Mr. N. that the analogy goes no further than to their external appearance, being entirely of a different species. The taste and flavor of the wine made at Hollywood are unequalled by any domestic wine produced on the American continent, and surpassed only by two descriptions of European wines.

Cotton Factory in Albany.

A Company has been formed in Albany, under the general manufacturing law, with a capital of $100,000 for the manufacturing of cotton fabrics. There will be from 80 to 100 looms, which will be worked by steam. This will give employment to some 60 persons, and will be a vast acquisition to that portion of the city. It is the intention of the Company to manufacture only printing and cotton cloths, and not to print.

Steam Boilers.

The following is the substance of a bill pending before the New York Legislature:

Sec. 1. No person hereafter to be allowed to control any steam engine or boiler, connected with any boat, car, or building unless he shall be a practical engineer, having a certificate as below.

Sec. 2. The Governor, with the advice and consent of the Senate, shall nominate a board of five skilful engineers, who have served an apprenticeship at the construction of boilers, who shall be commissioned to examine and certifiy as in the first section named.

Sec. 3. These commissioners to hold their office four years. Engineers acting without certificates to be guilty of a misdemeanor, and fined. The same penalty for such as shall employ uncertified engineers.

It is further urged that the law would be still better by providing that a steam boiler shall in no instance be within the building—that it should be in a house attached, or in a cellar under the street. Then the mischief done will not involve innocent persons, those only through whose carelessness the accident may be attributed to being the sufferers.

Genius.

Genius is properly the faculty of invention, by means of which a man is qualified for making new discoveries in science, or for producing original works of art. We may ascribe taste, judgement, or knowledge to a man who is capable of invention, but we cannot reckon him a genius. In order to determine how far he merits that character, we must inquire whether he has discovered any new principle in science, or invented any new art, or carried those arts which are already practised to a higher degree of perfection than former masters? Or whether, at least, in matters of science, he has improved on the discoveries of his predecessors, and reduced principles formely known, to a greater degree of simplicity consistence. or traced them through a train of consequences hitherto unknown? Or in the arts designed some new work different to those of his predecessors, though perhaps not excelling them. Whatever falls short of this is servile imitation, or a dull effort of plodding industry, which, as not implying inventions, can be deemed no proof of genius, whatever capacity, skill or diligence it may evidence. But if a man shows invention, no intellectual defects which his performance may betray can forfeit his claims to genius. His invention may be irregular, wild, undisciplined, but still it is regarded as an infallible mark of real natural genius, and the degree of this faculty that we ascribe to him is always in proportion to our estimate of the novelty, the difficulty, or the dignity of his invention.

A Paper Devourer.

In the Bank of England no less than sixty folio volumes, or ledgers, are daily filled with writing in keeping accounts! To produce these volumes, the paper having been previously manufactured elsewhere, eight men, three steam presses, and two hand presses, are continually kept going within the bank! In the copper-plate printing department 28,000 bank notes are thrown off daily; and so accurately is the number indicated by machinery, that to purloin a single note without detection, is an impossibility.

Ancient Britons.

The remains of ancient British villages have been discovered on the crest of a range of hills at Weybourne, near Holt. They consist of a collection of pits, each 4 feet in depth, and 8 in diameter, extending upwards of a quater of a mile, and sepulchral tumili in the neighborhood, forming the burial place, of the aboriginal tribe. Thus our *great*, forefathers lived in caves and dens of the earth.

Books.

Subscribers ordering books from us will be particular in stating how they wish them sent, as the law does not allow bound books to pass through the mail. We have now several in the office awaiting proper forwarding directions.

By the last news from California: greater discoveries than ever had been made of gold. One piece weighing 84 lbs. had been discovered and another of 35 lbs.

Medical Use of Salt.

In many cases of disorded stomach, a teaspoonful of salt is a certain cure. In the violent internal aching, termed cholic, add a teaspoonful of salt to a pint of cold water—drink it, and go to bed; it is one of the speediest remedies known. The same will revive a person who seems almost dead from receiving a very heavy fall, &c.

In an apoplectic fit, no time should be lost in pouring down salt and water, if suffiicient sensibility remain to allow of swallowing; if not, the head must be sponged with cold water until the sense return, when salt will completely restore the patient from the lethargy.

In a fit, the feet should be placed in warm water, with mustard added; and the legs briskly rubbed, all bandages removed from the neck, and a cool apartment procured if possible. In many cases of severe bleeding at the lungs, and when other remedies fail, Dr. Rush found two teaspoonfuls of salt completely stayed the blood.

In cases of bite from a mad dog, wash the part with strong brine for an heur, then bind on some salt with a rag.

In toothache, warm salt and water held to the part, and renewed two or three times, will relieve in most cases. If the gums be affected, wash the mouth with brine; if the teeth be covered with tartar, wash them twice a day with salt and water.

In swelled neck, wash the part with brine, and drink it also twice a day until cured.

Salt will expel worms, if used in the food in a moderate degree, and aids digestion; but salt meat is injurious if used much.

Keep this in Mind--

That all subscribers to the Scientific American, who commenced taking their paper at the beginning of Volume 5, and remitted but one dollar—that the time for which they have paid is now up, and that this is the last number they will receive unless they remit again.

Keep in mind—That two or more papers sent to one post-office, are folded in one wrapper, and they are, therefore, less liable to miscarriage.

Works on Science and Art.

DICTIONARY OF MECHANICS, ENGINE WORK AND ENGINEERING. Oliver Byrne, Editor.—Published by D. Appleton & Co.—This number has some excellent views of some foreign Bridges, Railroad Buffing Apparatus, Doughty's Bung Cutter, which appeared in Vol. 4, Sci. Am. Some indifferent views of Button Machinery: (a visit to old Barton's button machinery at Waterford, would have done good.) The Byrnegraph, or *Proportional Compasses*, and many other very good things.

MARINE AND NAVAL ARCHITECTURE. By John W. Griffiths.—Number 3 of this splendid work is just published. It contains three plates of sections of an Ocean Steamer, and explains the peculiarity of American shipbuilding, in constructing from models instead of drawings. It describes Chapman's system for calculating the displacement of floating bodies. This is a most valuable work.

Townsley's Water-Proof Blacking.

A few weeks since we noticed this article, recommending it as an excellent preventive to wet feet, and also as giving a fine polish to boots. Since the article referred to was penned we have had further opportunity of testing the merits of Mr. Townsley's blacking, and we not only endorse all that was said of it in a former article, but pronounce it the only kind we ever used that would render leather entirely impervious to water. This blacking was invented by Mr. G. R. Townsley, of Springfield Mass., and is an article that may be relied upon by those who wish to discard their clumsy overshoes, and still be found with dry feet and a handsome polished boot.

Contentment.

Content converts everything near it to the highest perfection it is capable of. It irradiates every metal, and enriches lead with all the properties of gold. It heightens smoke into flame, flame into light, and light into glory: a single ray of it dissipates pain, care and melancholy from the person on whom it falls. In short, its presence naturally changes every place into a kind of heaven.

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For the Scientific American.

The Electric Light, &c.

I had determind not to notice any remarks made by annonymous writers in the public journals, on the subject of the Hydro-Electric Light, deeming the fact of its public existence and action sufficient refutation of the many absurd attempts to disprove the discovery of a new principle, by instancing the failure of the same experiments when presented under the guidance of old theories. Had I at any time asserted that I had produced the rapid decomposition of water by the same means and process that has hitherto been taught by the books and the schools, I should deservedly have made myself the subject of newspaper ridicule—the theme of anonymous penny-a-liners. But as I have from the first claimed the discovery of a *new* principle, and the production of new results. I deny the right of any one, or the possibility, however honest he may be, to sit as arbiter on the matter, till such time as the nature of the discovery is made known, and as for a few weeks past I have been busily engaged getting a new apparatus ready for public inspection abroad, which would satisfy those skeptics whose distance from this city has prevented a personal examination of the apparatus. I have not had time nor inclination to notice the many absurd paragraphs, pro and con, which appear in the public journals, and the only consideration which now urges me to make this communication, is that it is both due to the public and myself to make such an explanation as will relieve the curiosity of the one, and extricate the other from the unpleasant position which the enthusiasm of his friends has placed him in.

During the winter of 1844–5, the late Col. Bomfort, of the Ordinance Department, and myself were engaged in some experiments, having for their object the precipitation of silex (in solution,) by the action of electricity; it being expected that glass so formed would be very dense, and consequently possess a high refractive power. During the course of experiments I became satisfied that so long as the whole body of water around the poles remained a conductive or diffusive medium, the action of the passing currents would be limited, and the results desired unattainable. With this view of the subject I sought for some method by which the atoms of water in contact with the poles, could be effectually barred from communication with any conducting substance, and yet admit of a continual supply of the water to be decomposed.

Believing in the doctrine of imponderability and immateriality of the electric fluid, all efforts to accomplish the desired result failed, and the experiment was about to be abandoned, when a doubt as to the truth of the books, on the question of the nature of electricity, arose in my mind, and on the faint hope held forth, the experiments were renewed, and the results more than realized the most sanguine expectations, for not only was the insulation of the water perfect, and the decomposition rapid, but the electric fluid was found to be susceptible of accumulation and condensation to an unlimited degree. The ease and rapidity with which the water was resolved into its component gases, naturally suggested the idea of applying the discovery to some practical use, and that of light was selected, as the most simple and inexpensive in its application. But on the very threshold of the experiment an apparently insurmountable obstacle was met in the inability to separate the gases.—After a number of serious explosions, the entreaties of my family compelled me to desist.

Although the practical experiments were abandoned, the mental action on the subject was not, and during some time in the fall of 1848, I concluded that the law which demanded an aqueous communication between the poles, or that the positive and negative poles should both enter one body of water, was not correct—a conclusion which a very simple experiment decided to be correct. One pole was inserted into a glass of water in the corner of a large room, and the other pole in another glass in the opposite corner, and an electrical communication made between. All the water in one glass was decomposed, and hydrogen only obtained. All the water was decomposed in the other, and oxygen only obtained. The result was known, the experiment was considered fully successful, and a small electro-magnetic apparatus, having its helices kept in motion by clock work, was put in operation at my dwelling, and was found capable of supplying three burners with an abundance of the gases. It was at this period of the experiments that I issued the circular announcing the discovery, and with it an invitation to the citizens of this place to call and examine for themselves.

In the spring of 1849, a light-house was erected on an eminence, near this city, and the experiment tried on a large scale for several months, at the light house, besides the lighting of a store in the city, the results being entirely successful in both places, and fully justifying the assertions made in the circular of announcement, and here I wish it to be understood, that this must not be considered a mere statement of mine, but the history of the fact is familiar to all whose appreciation of the discovery was sufficient to prompt them to visit my tower or dwelling.

The experiments at the light house continued until September, when an explosion occurred which cast a momentary damp upon the bright prospects of the discovery. This explosion was not due as intimated by "Carburetted Hydrogen," to the explosive nature of the gases, but to an entirely different cause—one peculiar to the construction and action of the instrument under consideration. That state or action of electricity known as Galvanism, produces decomposition; while that known as intensity, causes repulsion to take place at the electrodes, and deflagration of the decomposing cells is the consequent result. It was to the latter action that the explosion referred to was due, the gases being fired by the melting electrode. The realizing of the possibility of such an accident made it apparent that some method should be desired, other than that of personal observance, to prevent such explosions in future. The same agent that caused the danger must be made to remove it; this was no easy task, for independent of the natural difficulty in the case, the press was teeming with scurrilous inuendoes: the only difference in whose tenor was, that one journal consigned me to contempt as a humbug, and another to confinement as a lunatic. It is well, however, for the cause of science, that inventors are generally stubborn beings, firmly believing that they are able to perform all they promise, against all the sneers or contempt that may be brought to bear against them, and so in this case, perhaps, the "captious" feeling saved the invention, for the difficulty was overcome, and the apparatus made to govern itself, by the breaking of its circuits when a surcharge is passing.

It has required the labor of months to accomplish this last mentioned part of the invention, and although at the period of writing this, the danger of an explosion is entirely removed, yet the loud reports made by the breaking of the circuits are deemed adverse to the successful introduction of the invention to the public, but it is confidently expected that even this difficulty will be overcome in the course of a few days. Meantime the apparatus and its action is the daily subject of inspection at my rooms in the Exchange—nothing being screened but the interior of the helices and electrodes. The whole process of the decomposition can be seen, and if necessary, felt of.

The result of all the experiments up to this date are as follows:

The descent of a weight of 67 lbs. a distance of 9 feet, will generate 800 cubic feet of the gases, at no other expense than the interest of the cost of the apparatus, say $500. You may use the gases for light, power, or purposes of caloric. (I have as yet experimented only with the former,) and make your own deductions.

I receive many letters from your readers, asking what I claim as my invention: permit me here to reply, that I claim to have *discovered* a new principle in electricity, viz., ponderability, materiality, and obedience to the laws of gravitation. I claim to be the first to accumulate and compress the electric fluid; and I claim to have invented a machine or apparatus which enables me to use the electric fluid for useful purposes in the arts and sciences, at no other cost than the interest of its price.

HENRY M. PAINE.

Worcester, March 7, 1850.

Franklinite Iron and Zinc.

We hail with great pleasure every new discovery in science and in art, which may tend to develope the vast and almost countless treasures of our great country.

The working of the extensive mines of Franklinite and Red Oxide of Zinc, located in Sussex County, State of New Jersey, will not only richly reward the proprietors, but add much to the national wealth of the Republic.

It is within the memory of the present generation of men that from the vast coal fields of Pennsylvania, but a few hundred tons of fuel found its way to the seaboard, now its products are numbered by thousands and tens of thousands of tons, producing millions of dollars per annum. The great mineral riches of the United States, as yet, have hardly received a passing notice from our merchants and men of capital. Our countrymen generally have not much skill in Minerology and Metalurgy. We want schools for educating our young men in these branches of science, which will bring from the bowels of the earth the hidden wealth of centuries. Commerce has been the idol of our enterprising men, since the days of the Revolution. Alas! how many have found it a sea of storms and shipwreck and of ruin. And there are many of our old and highly respected merchants of the present day, who continue in business, not because it is found as profitable as in former days, but because they wish to bring up their sons to business, and choose their own calling, from the fact that they possess little knowledge beyond it. If one hundred millions of dollars could now be abstracted from commerce, where it is paying, upon the average, but a bare commission, and placed in a position to develope the mineral resources of our country, it would add to the national wealth at least twenty-five per cent. of the whole capital employed annually. The extensive machinery and other iron used incident thereto, in such steamships as the Ohio and Georgia, cost over $200,000, each, and much of the raw material is brought from abroad. Is the imported article superior to the American? Let the different tests speak for themselves:—

Geologists' Table.—Best Swedish Bar Iron required 72,064 lbs. force to sever a square inch: best English Bar Iron, 61,600.

Murray's Test, (Vulcan Works, Baltimore.)—Sussex Bar Iron, made from Franklinite, required 77,000 lbs.

These tests show that the iron made from Franklinite is the strongest article of the kind now known, requiring 15,400 lbs. more force to sever it, than the best English, and 4,936 more than the best of Swedish.

This American Iron must come into general use for wire bridges, railroad axles, chain cables, &c., as the company are prepared with works of sufficient magnitude to meet the demand necessarily produced from its great tenacity. Mr. Murray also made a test of the strength of the Zinc manufactured from the Red Oxide, and certifies that it is 10,000 lbs. stronger than the zinc of commerce. We learn that a metal of this kind is much wanted for ship bolts as a substitute for copper.

The Climate of Georgia.

Mr. J. T. Douglass, of Wallace Jones Co., Geo., writes us that he received a few fine red June apples that were gathered in the orchard of Mrs. Douglas, in the upper part of Gwinett Co., Geo., in the month of last December, and were the third crop of the season, and trees in the orchard were then full of blossoms for the fourth crop at the same time. Georgia embraces a great variety of climate, and is a great and rapidly growing State.

Gen. John McNiel, Surveyor of the port of Boston, died in Washington on the 2nd inst., of congestion of the lungs. Gen. McNiel was an officer in the war of 1812, in which he greatly distinguished himself for his bravery, and was severely wounded at the battle of Lundy's Lane.

For the Scientific American.

To Prevent Explosions.

In the first place, there must be a State Inspector or Inspectors of boiler iron, who are practical and scientific men, not carrying on the iron making business, to see that none but the best iron be rolled into boiler sheets. Then let every city and manufacturing town have a board of practical scientific engineers, who are not concerned in building engines or boilers as proprietors, to say how and where an engine and boilers may or may not be put up, and of what form and thickness the boilers shall be; allowing no one to have charge or run an engine, where lives are at stake, without passing the ordeal of the board of engineers, as a skilful and practical engineer, and a sober and attentive man. The boilers should be inspected every three months by a practical and scientific boiler maker, who is not afraid nor ashamed to go in and under them, acquitting himself of the obligation he subscribes to when accepting the office, and my word for it explosions will be few. Cadwalader Evans, a practical and scientific engineer, received the first appointment as United States Inspector of Steamboat Boilers, at Pittsburg, but the law placed him at the mercy of a chief judge of the court. When he protected the lives of our citizens, by condemning many boats or sets of boilers for one company, they had influence enough with the judge to remove him and have Major Wm. Wade appointed in his place, an honorable scientific engineer, but he did not like to make a sweep of himself by going in and under the boilers—as every conscientious man must do to fulfil his obligation, so he vacated, recommending Wm. McClelland, a practical boiler maker, who still holds the berth, giving satisfaction to nearly all parties, although, when he emerges from the furnace, you might not think that ingenuity, conscientiousness and moral principle could condescend even for a brief period, to be literally covered as a sweep from the chimney.

In the brisk period of 1835, '36 and '37, I was principal in the locomotive boilermaking for McClurg, Wade & Co., at Pittsburg; I then hesitated not to tell them, in 1836–7, that I did not believe that there was scarce any boiler iron made in Pittsburg, at that time, fit to make a boiler of. My reason for such conclusion was, I could not find any of the promiscuous sheets on hand, rolled for plain cylinder boilers, that would stand a flanch being turned upon it, even with the greatest care, though I have turned thousands of flanches in my day, without breaking or cracking. I then had to order the iron to be made, especially for our purpose. The great demand for boiler iron at that time, was the cause of its inferior quality. In the Cincinnati rolling mills at that time, men were known to stand with loaded pistols to protect the sheets as they came from the rollers, such was the competition.

THOMAS CHAMPION.

Music in Man.

The universal disposition of human beings, from the cradle to the death-bed, to express their feeling in measured cadences of sound and action, proves that our bodies are constructed on musical principles, and that the harmonious working of their machinery depends on the movements of the several parts being timed to each other, and that the destruction of health, as regards both body and mind, may be well described as being out of tune. Our intellectual and moral vigor would be better sustained if we more practically studied the propriety of keeping the soul in harmony, by regulating the movements of the body; for we should thus see and feel that every affection which is not connected with social enjoyment, is also destructive of individual comfort, and that whatever tends to harmonise, also tends to promote happiness and health.

Amount of Conversation Calculated.

The Rev. Mr. Gannet, of Boston, reckons that each individual averages three hours conversation daily, at a rate of a hundred words a minute, or twenty pages of an octavo volume in an hour. At this rate we talk a volume of 400 octavo pages in a week, and fifty-two volumes in a year.

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New Inventions.

Cast and Wrought Iron Rails.

A writer in the Railroad Journal says, with reference to the quality of the rails upon our railroads, that nothing but prejudice prevents the immediate substitution of cast iron for wrought iron railway bars. The Pottsville Mining Register, in alluding to the matter, says that from experiments recently made by the practical men of England, it is proved conclusively that the strength of cast is only 1-9th less than the wrought article: while the cost is 3-9ths less.

Cast metal resists much better the compression that flattens and exfoliates, the other as in the bars of the Reading railway; and by chilling the top of the cast rail, its resistance to compression and wear and tear might be perfect. The destruction by rust is very much less in the cast article. It is asserted that no cast iron track has ever been laid on continuous bearings, which ought to be an essential condition to fair experiment, because what is most feared, the tracture from percussion, is then entirely prevented. The idea is suggested also that the bars should be cast hollow, giving with the same weight of metal greater depth and strength to the rail.

Besides the difference in the general market value of cast and wrought rails, there would be another important saving, viz., along the route of most interior lines of railway, furnaces may be found to furnish the cast article at greater saving of carriage over the other; whereas iron rolling mills to make wrought rails are comparatively scarce.

[It is well known that cast iron does not oxidise and scale, like wrought iron, and so far as that comparison of their value is carried out, it is favorable to the cast iron. But, before any great change should be adopted in our railway system, fair experiments should be instituted for the purpose of determining the correctness of alledged improvements. The cast iron rail was in use for a long time in England, before the wrought iron rail was introduced, and it is not right to say, that prejudice prevents the introduction of the wrought in place of the cast rail. The ideas thrown out by the Mining Register are excellent and worthy of attention. We hopefully look for improvements to be made in the quality of cast iron. Should not the attention of iron manufacturers and founders be concentrated on this point? Is it not probable that iron, with all the qualities of the wrought for toughness, will yet come forth at once from the smelting furnace? We know of no discovery in the arts that would produce a greater change in social life, than one in the manufacture of iron, whereby its cost would be triply reduced, with its qualities of strength and endurance improved.

Guano.

In view of the increased demand for this article as the farming season opens, the price has been put up, and many farmers will, in consequence, resort to other manures to a greater extent, perhaps, than they had intended. For Peruvian $45 per ton is now asked, $35 for No. 1 Patagonian, and $30 for No. 2 do. To whatever the Guano may be applied, 400 lbs. per acre is the quantity necessary to ensure a good crop, and with every 400 lbs. 1 bushel of plaster should be thoroughly mixed, and ploughed into the full depth of the furrow, be that what it may.

New Lamp for Locomotives.

The Rochester Daily Advertiser says that Mr. Henry Ward, of that city, in making lamps for railroad locomotives by galvanic process. He plates the parabolic reflectors (which are constructed of Britannia metal) with silver and gives to them, by polishing, a surface which reflects with great power.

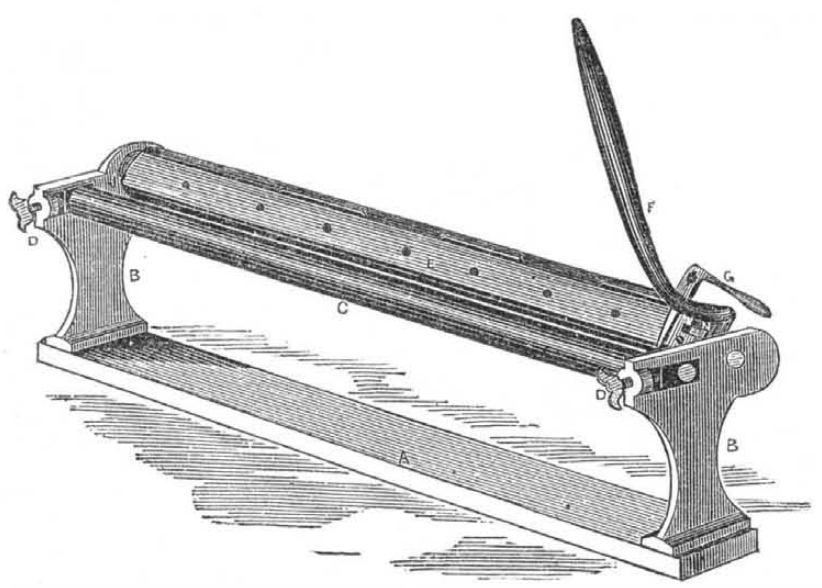
The smallest bird of America, is the humming-bird; and of Europe, the golden-crested wren. The smallest quadruped in the world, is the pigmy mouse of Siberia. The most diminutive plant is the Arctic raspberry, which is so small, that a six ounce vial will hold the whole, branches, leaves, and all.

A New Description of Steam Vessels.

For some days past, great excitement has prevailed at Marseilles, by the arrival in that port of an entirely new description of a steamer, and which, if successful, will cause a complete revolution of the present plans of building steam vessels. The vessel is named the "Port de Marseilles," and was built by a M. Lieutieur. It has not the slightest appearance of masts or funnel; in fact, there is nothing to show whether she is propelled by wind, or steam, or oar. She glides through the water as if propelled by some invisible agency. The propelling power is by a simple lever of sufficient power.—*European paper.*

[The above is a beautiful discovery to many besides ourselves; but it brings to our mind, a simple duty which we have to perform. It is this, to tell many, who believe it is otherwise, that there is no power in a lever. The power lies in the motor—either manual, water, gas, or steam, which moves the lever.

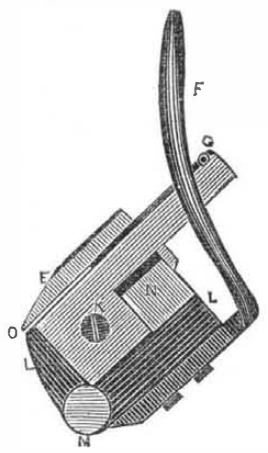
IMPROVED MACHINE FOR TINSMITHS, FOR TURNING LOCKS.---Fig 1.



This improved machine is the invention of Mr. O. W. Stowe, of Southington, Conn. Its peculiar qualities consist of two parts: 1st, The guage for the exact piece of the sheet of metal to be grasped by the machine to form the lock. 2nd, Making the jaws of the machine, in which the sheet of metal is placed, to close and to open, when the lock is formed, for the purposes of putting in and taking out the sheets rapidly, and holding the sheets of metal firmly while the lock is forming.

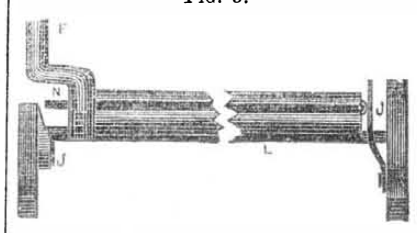
Figure 1 is a perspective view. Figure 2 is an end view of the rolling tumbler, with the posts, &c., removed. Figure 3 is a back view to show the wedge bar that opens and closes the jaws of the tumbler. The same letters on all the figures refer to similar parts. A is the bottom plate; B B are the two standard bearings; C is the cylinder roll. It is stationary, except that it can be set nearer or farther from the tumbler, by the set screws, D; E is the top, or moveable jaw; F is the lever to roll over the tumbler with the sheet in it, on to the roll C, to form the lock; G is the handle of the guage. To form a lock, the sheet of metal is inserted in the mouth O, (fig.

Fig. 2.



2,) of the tumbler, between the jaws E and L, and the tumbler rolled over on its axis, M, pressing the sheet of metal between the tumbler and the roll, C, (fig. 1,) thus making the lock. (The lock means the edge catch, or fold for hinges or stove pipe—this will convey an idea of what it is to those who are not acquainted with the art) To insure quick work, it is best for the jaws to be wide apart, that the workman may put in and take out the sheets quickly, but unless there was some arrangement to compress the jaws when the tumbler was rolled over, the sheet would fall out. To prevent this, the jaws close, when compressing, and open to let out the sheet afterwards. This is done by a peculiar arrangement, which we hope to explain clearly. It is this, while the whole tumbler rolls over on its axis, M, the upper jaw, E, has an axis, K, of its own, and therefore has a double motion. It is pushed over on its axis as the tumbler rolls over, and thus it compresses the sheet between it and the lower jaw, L. This is done by a sliding bar, N, (fig. 3) which has a small roller on one end of it. This bar moves on an inclined plane behind, acting like a wedge, and there are two inclined cam rails J J, fixed on the inside of the standards, B, which act as cams to push the said bar into its inclined groove, to raise up the back of the top jaw, E, rolling it over slightly on its axis, to close the said jaw when the tumbler is rolled over; and the lower rail J, pushes back the said bar down its inclined groove, when the tumbler is rolled back, thus opening and closing the jaws for the purpose stated. The upper jaw is therefore resting in and on a bed piece, L, to allow it to move, as explained; the front of the bed piece, L, of the tumbler, forming the lower jaw, as represented by fig. 2. G is the guage: it is a plate of metal fitting between the two jaws, E and L. It has a number of spiral slots in it, and there are fixed guidepins (not seen) passing through these slots. By moving the handle, G, to the right or left, the

Fig. 3.



guage or plate of metal is pushed down nearer to the outside edges of the jaws, or farther from it, as required. This is to allow the jaws to grasp only a guaged piece of the sheet of metal, according to the size of the lock. The guage can be set to any size of lock.

With the exception of compressing the jaws, and the *guage*, the rest of the parts are not claimed, but these are valuable and important improvements—every mechanic skilled in the art, will at once see this. Mr. Stowe has applied for a patent. More information may be obtained from him by letter, (post-paid.)

A saddle seam of coal has been discovered near Pottisville Pa. It is 46 feet thick. It is near the top and easily mined.

To Clean Straw Hats.

As the season is now approaching when our milliners' straw business of cleaning commences, we will give not only a few directions in that line, but the whole process, for the more especial benefit of those who are young in the art.

Straw hat cleaning and dressing, is one of the useful arts. The shaping, altering and dressing cannot be taught by words—because these branches of the business are practical, and can only be acquired by experience.—Leghorn, Tuscan, and fancy braids, which have to be materially altered in shape, are taken to pieces, of two parts, the front and the crown, before they are cleaned. Those which do not require to be altered in shape, are not taken to pieces, but cleaned and pressed entire upon a block of the requisite shape. As the shapes of hats change every year, blocks have to be altered for the purpose of pressing them.

To clean the straw hats, the whole lining and wiring are first taken out: then the most greasy parts are rubbed with soft soap and a clean hard brush, and then steeped in hot water (made soft with a little soda,) for about two hours. They are then well scrubbed with a brush and hard soap, along the run of the braids, until all the grease is removed. The crowns and fronts are brushed both inside and out. All the grease must be perfectly removed, and this is not an easy matter in some fronts. Some are full of oil, which leave a yellow color after the greasy part is removed. It is necessary to rub considerable soft soap on the most greasy parts. When all the grease is removed, they are well washed in hot water—two or three waters are necessary to remove all the soap. They are then left to steep in a solution of oxalic acid of a strength which has a pretty sour taste. Oxalic acid is poison yet it can be tasted without fear, only it must not be swallowed. Oxalic acid can be purchased in the form of crystals, like salts, at any druggist's. The oxalic acid vessel must be made of wood, kept clean, and the liquor preserved, a little being added, dissolved, to keep up the strength, every batch, if required. The hats should steep half an hour in this; it takes out iron stains better than any other acid. It is far better than lemon juice, and some use very sour milk, a very erroneous plan, which spoils the looks of the straw. After steeping in the acid, they are lifted up, on a small rack of wood, on the top of the vessel, to drip, and then (without washing) hung up in in the sun to dry. A loop of thread is made with a needle, in every hat, crown and front, to hang them up on hooks. They should be taken down when not quite dry, and by the loops hung on small round poles, to hang in a tight box, for sulphuring. The straws should not be allowed to touch any part of the box, and the box should be large and deep enough to allow an iron pot, with some red coals and some pieces of sulphur, to be placed in it, when all is shut up tight for about 12 hours. A cask, if it is perfectly tight, will answer, only it should be covered with a lid and a cloth placed over that. The sulphuring is a very unpleasant business. After being taken out of it, they are then altered in shape or stitched, when wanted, and then sized with a size made of pure white glue, or size made of boiled parchment, strained through a clean cloth. They are then hung out to dry, and afterwards pressed with damp clean cloths, on proper blocks. The great secret in straw cleaning is, cleanliness. In pressing straw hats, the irons, whether box or common flat irons, should be kept burnished bright on their faces, and clean, with a bath brick, on a board at hand. The pressing should be done with great care, and very rapidly—the iron being used very hot. It requires practice, however, to know the exact heat, and some can use a much hotter iron than others—this is a knack of the trade. Beware of burning the straw, and working with an unclean iron. It would be well for every laundress and housewife, to have a bath brick on a board at hand, when ironing clothes, so as to rub off any starch, or oxide, on the face of the iron. The above directions will be invaluable to many—as the plan described has been successfully employed by one of our oldest and most successful millinery establishments in this city.

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Scientific American

NEW YORK, MARCH 16, 1850.

Trouble about Patent Laws and Patents.

Ever since the present Congress assembled, our country has been agitated from one end to the other, because of the heavings and throes of the political heart of the nation at Washington. In the strongest sense of the word, America is a *political* nation. Every thing done in Washington is of interest to the highest and lowest of our citizens. Why? Because every man has an interest in the government. The millionaire may have his carriage and liveried servants and walk in social relationship far out of the reach of the humble mechanic, but at the Polls there is no Saul towering from the shoulders up above the people. With the struggles of political parties we do not interfere as journalists, although as citizens we feel a deep interest in every political movement.

Having said this much, we will now present some information about Patents—information of interest to our readers, but which appears to excite but little attention in the midst of those great questions, which are now agitating our whole country.

Within a few years a number of Americans have gone over to Canada, and are now manufacturing shoe lasts with Blanchard's machine, and send them into the States, competing with those who use Mr. Blanchard's machine on this side, and pay him his just patent fee. Mr. Blanchard and his friends have called the attention of Congress to the injustice of this system, whereby the residents of Canada enjoy a privilege denied to our citizens. A Bill has been reported to Congress to prevent this wrong, by taxing all lasts coming from Canada. This is the only way to remedy the evil. Whether the Bill will pass or not, we are not able to tell, but before the whole Bill becomes a law it should be submitted to the scrutiny of our merchants. We shall review this point next week.

Respecting those who manufacture these lasts in Canada, we have been informed that they are men who owned Mr. Blachard's machines, and paid patent taxes before the last renewal of his patent. When his patent was renewed they were prevented from using their machinery, and felt deeply grieved at this, considering it an act of injustice. Whether this is positively correct or not, we cannot tell, but we have been assured, positively, that it is. Mr. Blanchard's patent has caused great litigation. We don't like law suits, and we have often thought that it would have been the best plan to have recompensed Mr. Blanchard by paying him, in some way, a large amount for his ingenious invention, and throw it open to the public, as they sometimes do with inventions in France. His invention is a meritorious one, and has saved millions to our country.

By our Washington correspondence, our readers will see what Congress is doing about the Woodworth Patent. Our views upon certain subjects, are now appreciated by our Senators and Members of Congress. This puts us in mind of what Judge Kane, of Philadelphia, said in his address on the Patent Law before the Franklin Institute, last October. He hinted strongly at "an occasional newspaper to lead the jury astray by some distorted view of the evidence, or some ignorant commentary upon it," finishing up with a fling at the institution of the Jury itself. We believe that it is possible for a paper to be more impartial in giving an opinion in many cases, than a Judge. We at least take care to have no entangling alliances, and whatever our views may be, they are not the expressions of a heart controlled by the pressure of *ex parte* feelings, which warp the soundest of judgments.

The Committee appointed by the Baltimore Convention of Inventors have been urging upon Congress the necessity of Reforming our Patent Laws, as passed by resolutions at the Convention. We hope that some of the Reforms suggested, will be carried out, and we hope that others, passed by resolution, will not be presented to Congress. We know many of the members of that Convention—they are men of true worth—some others were there, no doubt from selfish motives—

"Down in this earthly house below,
The wheat and tares together grow."

The only thing to be watched, in such Conventions, is the making of them into political party engines.

THE PATENT BATTLE GROUND.

Philadelphia is the Patent Battle Ground of the United States. Before Judge Grier and Kane: Parker vs. Brant and others, application has been made for a writ of injunction against twenty-one different persons, to restrain them from infringing upon the principle of a re-actionary water-wheel, patented by complainant, which is propelled by the centrifugal force of the water. On the 8th inst., before the same judges, Knight vs. Rockafellow.—Motion for injunction to prevent infringement of patent for feeding axle-trees with oil, &c. Argued by W. B. Reed, for plaintiff, and Mallery for defendant. Ordered by the Court that special injunction issue unless the defendant alter his machine before rising of the Court, so as not to interfere with complainant's patent, unless it is shown that the time is insufficient.

Our Half Volume.

We hope that our half yearly subscribers, will not forget to send in their subscriptions early, as this number completes the first half of Volume 5. The Scientific American is allowed upon all hands, to be the best Mechanical Paper in the world. It is the Repertory of American Inventions, the Repository of Science and Art, and the Advocate of Industry. The articles which appear in our columns are written in a plain practical manner, divested of all tinsel and ambiguous learning, and made clear to the most common capacity. No inventor, mechanic, manufacturer, artisan or man of business, who has the least interest in the progress of Science and Art, can do without our paper. We publish, at great expense, all the claims, weekly, of the Patents issued from the Patent Office. Every number contains from five to seven beautiful wood engravings, illustrating new inventions, and explaining some of the useful arts. Our circulation is now 14,000, and has become the best medium of presenting a knowledge of American inventions to our great country and the world. Although our circulation is so large, yet it should be larger, when we take into consideration the extent of our country, and the now large population of the United States.

Through the kindness and interest of our present subscribers, we look forward to a continued increase,—promising to increase, (as we have done) the usefulness of the Scientific American.

MESSRS. EDITORS—I was much surprised to find a notice in your last number, stating that there was an error in the article on "Air Guns," in the New Dictionary of Mechanics, &c., now being published by Messrs. Appleton. Every thing stated as fact has been tested by numerous experiments. I have no time, at present, to write an article on the comparative effects of the elastic force of fired gunpowder, compressed air, and expanded steam, (three heterogeneous elements,) but in subsequent articles on Pendulum, ballistic; Gun Powder, Gun Cotton, &c., I will show that I have not come to a hurried or undigested conclusion, and that I do not take the mere word of the highest authority on mathematical or philosophical subjects. I need scarcely add, that if your remarks had been confined to a *critique* on the arrangement, style or general execution of the work that I am editing, I should not request you to publish this communication, or interfere in the slightest degree with your high privileges as reviewers. I am yours, obediently,

OLIVER BYRNE,

80 Nassau st., N. Y., 6th March, 1850.

[We are obliged to Mr. Byrne for his concluding hint, but we are the best judges of our own province in *critique*. Criticism, for the mere sake of criticising is a mean business. We do not claim any immunity from criticism—we dread it not from others, and fear not to engage in it ourselves, when we have a good object in view. The very article to which Mr. B. refers, which was published in the Sci. Am., page 188, will explain our motives; we therefore re-insert it:—

"We notice an error in the article on 'Air Guns,' in the excellent new Dictionary of Mechanics, published by the Messrs. Appleton. It is stated that 10 atmospheres, or 150 lbs. pressure, will produce an effect nearly equal to gunpowder. . . . A friend of ours once spent several thousands in getting up a steam gun, taking it for a positive fact (because stated by Mr. Perkins) that steam, at 600 lbs., pressure, would project a ball with a force equal to gunpowder. He found to his surprise and loss that 1000 lbs. pressure could not produce an effect equal to gunpowder. We make these remarks to prevent any person from spending money on vain projects."

Now we will quote from Mr. Byrne's work to show whether he has "come to a hurried or undigested conclusion:"—

"The Air-Gun is a machine in which highly-compressed air is substituted for gunpowder to expel the ball, which will be projected forward with greater or less velocity, according to the state of condensation, and the weight of the body projected. The effect will, therefore, be similar to that of a gun charged with gunpowder, for inflamed gunpowder is nothing more than air very greatly condensed, so that the two forces are exactly similar. There is this important consideration to be attended to, namely, that the velocities with which balls are impelled are directly proportional to the square root of the forces; so that if the air in an air-gun be condensed only ten times, the velocity will be equal to one-tenth of that arising from gunpowder; if condensed twenty times, the velocity would be one-seventh that of gunpowder, and so on. Air-guns, however, project their balls with a much greater velocity than that assigned above, and for this reason, as the reservoir or magazine of condensed air is commonly very large in proportion to the tube which contains the ball, its density is very little altered by passing through that narrow tube, and consequently the ball is urged all the way by nearly the same force as at the first instant; whereas the elastic fluid arising from inflamed gunpowder is but very small indeed in proportion to the tube or barrel of the gun, and therefore, by dilating into a comparatively large space, as it urges the ball along the barrel, its force is proportionally weakened, and it always acts less and less on the ball in the tube. Hence it happens, that air condensed only ten times into a pretty large receiver, will project its ball with a velocity little inferior to that of gunpowder."

Having fairly presented both sides of the question, we would candidly ask, were we not correct in our statement. Mr. B. does not need to write a new *article* on the comparative effects of the elastic force of fired gunpowder, and compressed air, he has done so already. The article copied above is taken from his work, pages 11 and 12, and he tells us that "inflamed gunpowder is nothing more than air very greatly condensed, so that the two forces are exactly similar." Now, there is no mention of heterogeneous elements here—but we have two singularly contradictory statements: first, that air condensed ten times has a velocity equal to one-tenth of gunpowder. Second, that air condensed ten times, (into a pretty large receiver) "will project a ball with a velocity little inferior to that of gunpowder,"—a wide difference, truly.

We stand ready to back up all that we have said, with positive proofs, from living practical experimenters. With a rifle or musket, we will undertake to beat any air-gun of equal size and bore, and allow the owner to carry a magazine of condensed air, as large as Trinity Church, if he choses. We hope that Mr. Byrne in his article on *Gunpowder*, will give a more scientific description of its action on the ball in the barrel, than in the above, which we can assure him is very defective in that respect. If our article surprised Mr. B., his letter has surprised us more. The concluding part of it, is either a fling at us, or Messrs. Appleton, we cannot tell which, for both it and the article quoted, contain *bulls*.

Reform of the Patent Laws.

In the months of August last, a Convention assembled at Baltimore, for the ostensible purpose of Reforming the Patent Laws, and judging from the correspondence of the Sci. Am. of last week, the committee appointed by that Convention are now in Washington, for the purpose of urging upon Congress, *the making Law of the Resolutions* adopted by the said *Convention*. The Convention was termed a "National Convention of Inventors." It was composed of some inventors, patent lawyers, patent agents and patent speculators. Many of its members are known to be men of sterling worth,—they acted from the best of motives, and a number of excellent measures were adopted. On the other hand, some resolutions that were adopted, show that there were some who had an eye to number one. We have been blamed, as a nation, for being greedy of gain, and to have few conscientious scruples in making the almighty dollar. The Girard and Smithson bequests were regarded by many as fine objects (were it possible,) of personal plunder, and there is a great want of patriotism in not looking upon public funds as a sacred deposite. There are too many who look upon Uncle Samuel as a *fine old* American gentleman, into whose pockets they have a perfect rigt to put their hands when convenient. The Patent Office has a surplus fund of $170,000—quite a respectable amount of genuine mint drops, and being spare change, why might it not rather be jingling, some way or other, in the pockets of *disinterested* men, whose sympathies are all *with* inventors, than be kept locked up in the great iron chest of the Sub Treasury. The Convention passed the following resolution:—

"Resolved, That Judges Phillips and Rand, and Geo. Gifford, Esq., be requested to prepare a section, making provision for publishing, in three or more weekly or monthly publications, all patents hereafter issued, with drawings, when such are requisite to explain the specification, and that such publication will be made within three months from the issue of the patent, and the expense be paid out of the Patent Fund."

Offered by Mr. Englebrecht of New York. As the whole fund paid into the Patent Office, in one year, would not be sufficient to carry out the above resolution, the surplus fund of the Patent Office was no doubt looked upon as a *reserve guard* against contingencies. Whether any of the members intended to go into the printing businsss or not, they know best themselves. Another Resolution was passed, to create a printimg office and lithographic office, in connection with the Patent Office. It was offered by Prof. Renwick, of New York. It was to the effect, that the Patent Office, instead of writing out the patents, should set up the specification in type, with the drawings in lithograph, and print fifty copies—two for the Patent Office, and the rest to the inventors and the U. S. District Courts.

It is very surprising that a body of men, some of them so learned and intelligent, should have passed such resolutions. The whole income of the Patent Office would not suffice to carry out any of them. The one offered by Prof. Renwick, however, is essentially a good one, and would be of great benefit could it be carried out by the present revenue of the Patent Office. If the Committee appointed by the Convention urges upon Congress the making of these resolutions into *Laws*, such laws would be the extremity of impracticable legislation. The passage of such resolutions shows that hasty and inconsiderate action formed a part of the proceedings of the Baltimore Convention of inventors.

The Committee on the reform of the Patent Laws, was composed of Judges Phillips and and Rand, and Geo. Gifford, Esq., of New York. Their report embraces many good and necessary reforms as amendments to the present Patent Code—amendments which should become law. As it will be some time before Congress can *Act* upon them, if at all during this Session, the discussion of them will be continued in one or more future articles.

JUNIUS REDIVIVUS.

New York.

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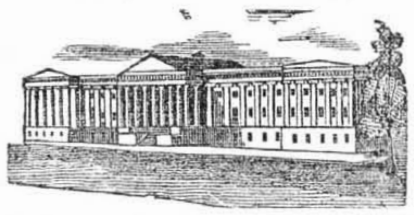

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending March 9, 1850.

To A. W. Barker, of Suffolk Co., Mass., for improvement in Invalid Bedsteads.

I claim the combination of the inclining frame B, with the back, seat, foot frames, and main bedstead, substantially, in manner as herein before specified.

To Wm. B. Barnard, of Conn., for adjustable cord-hook for door-springs.

I claim the use of the adjustable cord-hook or attachment for the cord, whereby the tendency of the spring to close the door is made to vary at pleasure, as herein set forth.

I also claim in combination with a spring and fuse, having the diminution of the diameter of the coils on the fuse more rapid than the decrease of elasticity in the spring, by uncoiling the movable cord attachment, whereby the tendency of the spring to close the door is varied more rapidly than would be due to the simple change of position of the hook alone, in the manner and for the purpose herein set forth.

To A. Clark, of Southfield, N. Y., for fastening for hay and manure forks.

I claim forming the tines or prongs of the hay fork, and additional tines or prongs, which convert the same into a manure fork, out of simple bars of steel, bent to the desired form, and securing the same to the handle by inserting them through the slot or mortise in the same, and driving keys or pins behind the same, substantially as herein set forth.

To T. G. Clinton, G. H. Knight, & E. H. Knight, of Cincinnati, Ohio, for improvement in carriage-jacks.

We claim constructing the lever or its equivalent, with teeth prongs and canes or the equivalents, in such juxtaposition, the one with regard to the other, that when it is necessary to release the rack from its load, these parts of the lever appropriately unite in action with the teeth, and the ways of the rack or their equivalents, and with the pendents and the tooth of the catch or their equivalents, to take the load off and release the catch, retract, and make the frame of the catch a fixed point of resistance for the prong of the lever, force out the lever tooth from the rack tooth (the cam the while putting pressure upon the ways of the rack) and oppose by the cams, the requisite friction and consequently resistance to the descent of the rack, the whole being arranged substantially in the manner and for the purpose set forth.

To Joseph Dixon, of Jersey City, N. J., for improvement in firing kilns for pottery ware, blacklead crucibles, &c.

I claim the use of rosin or the distillation thereof, as a combustible for baking pottery and all other kinds of earthen ware substantially as described, as a means of preventing such articles from being overfired or slackburned and whereby also the injurious action of atmospheric air on the surface of blacklead crucibles, pottery ware, bricks, &c., is avoided as described.

To S. Eccles, of Kensington, Pa., for improvement in looms for figured fabrics.

I claim, firstly, obtaining the picking motion, or (otherwise expressed) giving to the picking shaft, by means of the shaft D, carrying the picking fingers oscillating with the lay in combination with the mode of raising and depressing the fingers by the combination of the cam and lever, the said cam being detached from the other parts of the loom, thereby enabling it to be easly changed, in the manner and for the purpose above specifiied.

Secondly, I claim the pattern plates, made and worked in the manner and for the purpose herein fully made known, in combination with the pattern levers, with the pins fixed in them the lever and cam, for the purpose of lifting said pattern levers, the star-driver, star plate, mitre wheel, shaft and bevel wheel and in connection with a cylinder. The respective motions herein referred to, being carried on, or effected substantially in the manner and for the purpose herein fully made known.

Thirdly, I claim the combination formed by the mechanism, for moving the shuttle boxes, that is to say, the cam lever and pulling catches together with the lever wheels, (four); and intermediate bevels (two), together with the star-divers and star plate and pinion and the shaft bevels (two), and shaft together with the star-diver and star-plate; said bevels, shaft, star divers and stars, oscillating with the lay, and acting from the same centre, so that the connection between the shuttle-boxes and bevels is near broken or detached. The whole being constructed and arranged, in the manner and for the purpose herein fully described.

I do not limit my claim to the precise arrangement herein set forth, nor to the moving of any particular description of shuttle boxes, but I do claim my combination of motions used for the purpose of moving shuttle boxes of any description, when such arrangements and combinations are substantially the same with that herein described.

Fourthly I claim the apparatus for holding the pins in the bevels (four), and consequently the shuttle boxes connected therewith, in a proper position; or more particularly the lever and rod connected to the bracket, or carrier and the action to said lever being given by the oscillation of the lay, in the manner and for the purpose herein specified.

To N. Edwards, of Chittenden Co., Vt., for improved apparatus for regulating the depth of water in vessels' holds.

I claim the combination of of the secondary index hand apparatus, with the primary index hand apparatus or that which denotes the depth or rise of water, the secondary index hand apparatus being for the purpose of registering the extreme depth, as above stated.

To W. W. Grant, of Providence, R. I., or improvement in machinery for dressing hemp and flax.

I claim, the combination of the toothed cylinder the wind passage, the trunk, the endless apron, the set of feed rollers, the concave and this waste apron the whole arranged and made to operate together substantially in manner and for the purpose as above set forth.

And in combination with the feed apron its roller and toothed cylinder, I claim the protecting shield, the same being for the purpose of protecting the apron from injury and wear as specified, also to protect the journals of the rollers from winding up with waste or lint.

To G. S. Hacker, of Charleston, S. C., for improvement in Railroad Cars.

I claim the supporting and connecting both ends of the main platform of a railroad car, each with the centres of secondary platforms, which secondary platforms are connected at each end with and supported each on four wheeled trucks, all substantially in the manner and for the purpose specified.

To R. J. King, of Lancaster, Pa., for improvement in Corn Ploughs.

I claim the movable expanding wings, combined and moved substantially in the manner and for the purpose herein described, by means of right and left screws on a cranked shaft, that can be turned while the plough is in motion.

To James McGregor, Jr., of New York, N. Y., for improvement in Cooking Ranges and Air-heating Furnaces connected therewith.

I claim, First equalizing the heat in the oven by allowing the air to circulate and ascend through the chamber between the fire-box and front oven plate, for the purpose substantially as set forth.

Secondly, I also claim so constructing the contractors as that two of the boiler holes may be changed into one, of the same size as either of the other two, by which means, a boiler hole may be had directly over the centre of the fire, or four boiler holes reduced to two, all being of the same size, as described.

Thirdly, I claim in combination with the air heating apparatus the disposition or arrangement of the valves (three), with either of the valves (two) on the door, for the purpose of ventilation as described. The position of the valves are not material, so that their combined operation shall be as set forth.

To James MacGregor, Jr., of Wilton, N. Y., for improvement in Air-heating Furnaces.

I claim first, making the heating cylinder in sections, in combination with the segments of tubes or verticle cavities, cast on the plates at the laps, containing sand substantially as described, whereby they are rendered air tight as described.

2nd, I claim the mode of fastening the handle to the grate and keeping the grate true with the handle by means of the bolt, by which they are connected with the two studs, as substantially set forth.

3rd, I claim the separate chamber for the fire pot which is suspended below the chamber of combustion to prevent the air heated by the fire pot from entering in to the air chamber, surrounding the heating cylinder for the purpose and in the manner as substantially set forth.

4th, I claim admitting air and flame through the pipe, and its aperture or apertures, into the chamber of combustion and radiation, in the manner and for the purpose substantially as set forth.

5th, I also claim this mode of introducing the heated air and flame in combination with the descending draught as described.

To C. M. Nelson, of Cincinnati, Ohio, for improvement in Cooking Stoves.

I claim the arrangement of the valve or damper above the back plate of the fire chamber, in combination with the register for regulating the draft, as herein fully set forth.

To C. E. & C. H. Paris, of Paris, France, for improvement in the composition of enameling hollow-ware.

Having thus described the nature of our said invention and the manner of performing the same, we would have it understood that we do not confine ourselves to details herein given, but what we claim is the new and useful glazing composition for coating articles of iron to prevent oxidation substantially as specified.

To Wm. Payne, of New York, N. Y., for improvement in apparatus for retaining cars on the rails.

I claim combining the trucks or other suitable parts of locomotives, freight and passenger cars with the rails by meanes of two bars, one vertical and one horizontal, connected in such way that oscillation and other vibratory movements of said cars will be permitted without disengaging the hooks or rollers attached to the lower ends of the vertical bars, from the flange of the rails, the whole being arranged substantially in the manner described herein.

To A. D. Perry, New York, N. Y., for improved winged metalic cartridges.

I claim the method of enclosing the charge of powder in the hollow part of the ball by slitting its rear end and bending on the parts so slitted, substantially as herein described, that when the ball is discharged the parts so slitted may be forced out to become feathers or wings to guide the ball substantially as described.

To Geo. Riley, of New York, N. Y., for improved process in the manufacture of glucose.

I claim the conversion of corn meal into a solution of grape sugar or glucose by boiling the same under a pressure greater than that of the atmosphere in water, acidulated with sulphuric acid, substantially in the manner described.

To C. W. Russell, of Washington, D, C., for improvement in the construction of fire-places and throats of chimneys.

I claim constructing chimneys with an additional flue in the back of the fire place, made in the manner and for the purpose herein fully set forth, in combination with the bringing down of the main flue of the chimney stack, as above described—with the horizontal offset at the top of the back of the fire-place and the spaces at the sides all as herein fully set forth.

To Wm. H. Saunders, of Hastings, N. Y., for improvement in Mail Axles.

I claim the making open grooves of what ever form, cast or cut, in or upon the large end of axle boxes upon carrage axles, technically known as mail axles and upon axles for cars with short bolts, with whatever form of head fitted into the grooves, for securing the wheels and boxes upon such carriage axles, and upon cars in the place of and to supercede long bolts which are now in use for securing such wheels and boxes.

To F. H. Simpsen, of Boston, Mass., for improvement in Cooking Ranges.

I claim extending back the front boiler chamber or chambers, to or from the back boile chambers, at the sides of the elevated oven, substantially as described, in combination with the partition or partitons, at the side of the front boiler chamber or chambers, when the said partition (or partitions) is provided with flue holes at the side of the side boiler or boilers and back of the back boiler or boilers, and leading to the flue around the elevated oven

To E. Whitely, of Boston, Mass., for improvement n Chimney Caps.

I claim the improved ventilator constructed of a series of external plates, a series of internal plates and openings or smoke passages, arranged, covered, and applied to a flue and made to operate together, substantially in the manner as above specified.

To N. J. Wyeth, of Cambridge, Mass., for impr ved Scraper, for removing snow from ice.

I claim an ice scraper, constructed substantially as described, that is, in the form of a triangle, (so that in moving in either direction, the snow will be thrown by the diagonal sides at right angles to the course of the scraper) and the base having guides which move in grooves formed in the ice and control the motions of the implement, as herein set forth.

To James Long, of Chicago, Ill., for improvement in Gasometers.

I claim the use of the four mercurial valve cups, as described, for filling and discharging alternately the two measuring gasometers as set forth.

I also claim the shaft in combination with the levers and pawl, for giving simultaneous movement to the hands of the dials, the valves, and the gasometers as set forth.

RE-ISSUES.

To C. Whipple, of Providence, R. I., (Assignor to New England Screw Co.,) for machine for cutting the threads of Wood Screws. Patented Aug. 18, 1842.

What I claim is, first, in combination with the shaft or mandrel which gives the rotary motion to the screw blank, the employment of the rotating wedge formed cam or the equivalent thereof for determing the pitch of the thread and for permitting the return motion to repeat the operation substantially as described.

Second, causing the chaser or cutter at each successive cut to approach nearer to the axis of the screw blank by means of a revolving conical cam, which at each successive operation acts by a greater radius, substantially as described.

Third, governing the motions of the chaser or cutter to make the core or body of the screw of a conical or tapered form along the whole or any part of its length, by combining therewith a cam of gradually enlarged diameter, substantially as described, the form of such cam depending on the form intended to be given to the core or body of the screw.

Fourth, combining the cam which determines the form of the core or body of the screw, to make it tapering or concial in whole or in part with the chaser or cutter by means of a rock shaft and adjusting lever substantially as herein described, the said adjusting lever being interposed between one of the arms of the rock-shaft and the face of the cam, so that by the use of a set screw or other analogous device the cutter or chaser may be readily set, as described.

Fifth, shifting the cam which determines each successive cut of the chaser or cutter by combining therewith a ratchet movement operated by an eccentric or cam, the wheel of the ratchet being provided with pins which operate a lever connected with the cam shaft.

Sixth, disconnecting the shaft or mandrel from the driving power at the end of each complete operation of the machine, by combining the clutch or the equivalent thereof, with the ratchet by means of an index-wheel or perforated rim, which, at the required periods, liberates or acts upon the connections of the clutch to disengage it, substantially as described.

Seventh, making the chaser or cutter for chasing or cutting the threads of wood screws by machinery with a groove of the form of the thread in its cutting face and in the direction of its length, as described, whereby the said chaser can be sharpened by simple grinding off at the end, and without changing the form of the groove, and whereby also the said chaser cuts on both sides of the thread, and finally on the edge thereof, as described.

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TO CORRESPONDENTS.

"D. D. M., of Wis."—The drawings and elaborate description of your apparatus for drying fruit have been carefully examined, and we have decided that although it possesses some novelty, it would not be advisable for you to make an application for Letters Patent upon it. The novelty of your machine consists only in the combination of well-known principles, and it would be a difficult matter for us to base a claim that could be sustained in a court of justice, even if a patent was allowed.

"J. R. S., of S. C."—If you order a copy of Minifie's Drawing Book, it must be sent by Express or some private individual. The Postmaster here has forbid us forwarding *bound* volumes by mail any more. We can take off the cover, if you desire, and forward it by mail; the expense will not exceed 25 cts.

"G. L., of N. Y."—The drawings of your machine for manufacturing bolts have been carefully examined, and it is evident you have much ingenuity for contriving. If you will send us a model we will express a more full opinion upon the case, after examining it: we think there is no doubt but what it is a patentable invention, judging from the imperfect drawings that you have furnished us.

"E. A. D., of N. Y."—We cannot furnish you the claims of Mr. W., unless you remit us one dollar. It is asking too much to write for copies of other people's inventions, without enclosing a single dollar to pay for transcribing: the Patent Office would charge three times as much for a copy.

"L. M., of Conn."—The information which you solicit, we cannot give. $1 credited on subscription.

"W. H., of Mass."—An engraving of you brake, published in the Scientific American, will cost you $8. If you wish a cut prepared for you, please notify us at once by enclosing the amount in a letter, and forward to our address.

"J. R., of Conn."—In volume 2 of the Sci. Am., you will find a series of articles on Electro-plating, among which is the particular receipt to which you refer.

"D. V., of O."—We should be pleased to receive a communication from you on steam explosions and if you advance any new ideas they shall have a place in the Sci. Am.

"T. R., of Pa."—You could not obtain a patent for the contrivance described in yours of the 15th. We have seen the same device before.

"C. W., of N. Y."—We accept of your proposition, under the circumstances referred to.

"J. I., of Ohio."—We could not advise you to patent the invention abroad, unless you intend to manage it yourself. Parties are very scarce here who will advance money for foreign patents. You could undoubtedly get one, as we see nothing to prevent it.

"S. M., of Ala."—We forwarded you Gilroy's work immediately upon the receipt of your former letter, and presume you have received it before this time.

"C. W. M., of Geo."—A 6 inch compass the kind most used, is worth $26; chain, 4 pole $2,50; case of instruments from $10 to $15. Can be sent to Charleston by steamer. Dont know the charge.

"C. S. H., of Pa."—Speaking tubes are in extensive use here and elsewhere, and we think Gutta Percha is now used for that purpose. $2 received, and the detector sent.

"O. E., of Mass."—Your application must await its turn for examination at the Patent Office, and the result will be duly reported. We think your washer will take well, at any rate, we see nothing to prevent. We cannot, however, tell how it may take among the thousands now employed in California. You had better sell all you can to those who are intending to go.

"J. K. H., of Ala."—Your favor came safe and each name has been entered for one years' subscription. The best and safest way to send the model will be to ship it from Mobile, we receive many in that way.

"A. H. R., of Pa."—We have entered Mr. B.'s name for one year, and have not sent the Report.

"S. S., of Ala."—Your method of constructing an alarm, is altogether a new one to us. A portion of the operation would be very disagreeable to a lazy man, and you must despair of any patronage from such. We are of the opinion that you never will make a fortuno out of it.

"W. C. C., of Ala."—We cannot give you the price, nor the place where J. E. Gowen & Co.'s Submarine Armor can be had.

"E. G. M., of Troy."—The drawings of your Shingle machine have been examined:—we believe you have hit upon a new and good plan, and advise that you construct a model without delay and forward it to this office.

"R. C., of Geo."—You can put yourself in communication with the owner of Dr. Potts' Pile Driver, by addressing him according to reference given in No. 21, which you will please refer to. The Excavating machine is an English invention; they cannot be had in this country.

"M. S. N., of N. Y."—In Blanchard's patent the material and pattern both revolve. Patterns are not new.

"W. N., of Ill."—The principles of your hay press are the same as those found in the Cotton Press of Wm. Mudge, of Geo., and some others that we know of. The Press is a good one, but we do not think a patent could be secured for it.

"A. S. D., of N. Y."—Before receiving your letter we had advised J. W. & Co., where such machinery as they wanted could be had.

"E. A., of N. C."—You can obtain such a machine as you want of Jesse Leavens, Palmer, Mass. You will see his advertisement on this page.

"C. H. G., of N. H."—We have no such works as you refer to.

"S. C. A., of Miss."—The beans should first be ground, and then pressed in a strong common press. If you want a larger quantity of oil, the beans should be warmed; by this process, however, the oil would not be as good as that produced by the cold press. We do not sell the lathe referred to; the information should be obtained of the inventor. Book sent as ordered.

"W. C. S., of Richmond."—The Excavating machine is an English invention, and we have no knowledge of it more than we have given.

"G. W. C., of Pa."—You can obtain a Portable Forge of Edward Flagler, of this city—prices vary according to size; for further particulars address him. Isaac Munden has recently obtained a patent for an excellent machine for boxing wagon hubs, he resides in Allegheny City, Pa.

"S. G., of N. H."—We cannot comprehend fully the advantages to be derived from your self-moving power, and allow us to say that this point can only be determined by experiments. We are often surprised when we hear of mechanics spending 10 or 15 years over such contrivances, and although we do not know what you may have done after 40 years' study, still we believe that your plan will never result to your benefit.

F. R. B., of Ill."—We should think the lathe could be shipped safe, by some line, to you. It might be sent along with some merchant's goods. Mr. M. will need to send $1 additional to complete this year.

"J. P. N., of N. Y."—We de not think a patent could be obtained for your Syphon. It is different from the one referred to.

"J. C., of N. Y."—You will have to wait 5 months before you can file a Caveat. We did not understand your former query.

"G. A. I., of Ky."—At present we do not know where a one horse engine and boiler could be purchased, but your letter has been filed, and will be attended to in case we are able to find one.

Money received on account of Patent Office business, since March 5, 1850:—

P. J. C., of Conn., $30; C. R., of La, $30; McC & N., of Mass., $50; V.P, of Ia., $20; S. & H., of Mass., $25; R. G. B., of Conn., $30; T. N. S., of N. Y., $25; and G. F., of Me. $30.

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"Scientific American," Vol 4, bound,	2,75
Minifie's Drawing Book,	3,00
American Steam Engine, Plate and Book of Description.	3,00
Scribner's Mechanics, Tuck, Gilt,	1,25
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Leonard's Mechanical Principia,	1,50
Mahan's Civil Engineering,	3,00
Morfitt's Chemical Manipulations,	2,50
Instructions for Testing, Melting, and Assaying Gold	,25
Duggan's great work on the Stone, Iron, and Wood Bridges, Viaducts, &c., of the United State's Railroads. Published monthly in parts to be completed in 12 parts. Parts 1 and 2 now ready, each	,75

N. B. This work is supplied to subscribers only.

THE GRAEFENBERG MANUAL OF HEALTH.—The Manual of Health just published by the Graefenberg Company, 7 parts, 300 pages, 12mo. This is the most useful and comprehensive, as well as the cheapest medical work extant, and should be in the hands of every family. Part 1st contains an account of the different medical theories of the present day, both good and bad, and their relation to the health of the community. Part 2d presents a new doctrine: The Americo-Graefenberg System, which need but be understood to command the confidence of the whole community. Part 3d describes the causes, symptoms and treatment of almost every form of disease, including those diseases peculiar to females and children, useful to all classes, even to physicians, as a hand-book. Part 4th contains important directions for preserving health, &c. Part 5th, Hints for Nurses, treatment of persons recovering from sickness, cookery for the sick, &c. Part 6th, Domestic remedies described, including mode of raising and preserving medicinal roots, &c., making lotions, poultices, colognes, cosmetics, &c. Part 7th contains a collection of useful tables, recipes, &c. For sale at the office of the Graefenberg Co., 50 Broadway, and by booksellers generally. Price 50 cents. Liberal discount to dealers.

NOTICE TO POSTMASTERS.—As it is the wish of the Company to distribute this work extensively, any Post Master forwarding $2 for four copies shall be entitled to one copy gratis. tf

MACHINERY.—S. C. HILLS, No. 43 Fulton Street, N. Y., dealer in Steam Engines, Boilers, Iron Planes, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 26 6t

STIVEN'S PATENT EPICYLOIDAL ROTARY PUMP—Alexander Stivens most respectfully invites the attention of shipowners and captains of ships, the proprietors of buildings, spirit dealers, and beer sellers, and the public generally, to his unequalled Rotary Pump. An examination is only necessary to satisfy any person of its utility. I can be seen at the workshop, 70 1-2 Bowery, in the rear, or at JOHN WHITAKER'S, Harmony Hall, No. 17 Centre street, where one is placed for public inspection. Patent rights for sale. 24 3*

THE AMFRICAN TURBINE WATER WHEEL is illustrated in Vol. 5, No. 3, of the Scientific American. The subscriber offers rights for sale by counties, in the States of New Hampshire and Massachusetts, and the counties of Westchester, Putnam, Dutchess, Columbia, Renselaer, and Washingington, in the State of New York. All communications addressed to him at Valatia, Columbia Co., N.Y., will receive prompt attention.
24 4* R. DEDERICK.

THOMAS J. WELLS, WOULD RE-spectfully inform his friends and the public in general that although he is executing large orders of plaining and saw-mill machinery for San Francisco and Oregon, he has not "gone to California," and if any of his patent slitting, scroll, or timber saw-mills are wanted, he is still "at home," and prepared to fill with promptness any order in his line, at foot of Twenty-ninth st., N.Y. 24 2*

SASH AND BLIND MACHINE—Patented by Jesse Leavens, of Springfield, Mass., is the best Sash and Blind Machine now in use. The Machine cost $300 at the shop where they are made, near Springfield—extra charge for the right of using. The machine does all to a Window Sash and Blind except putting them together. Orders from abroad will be promptly attended to, by addressing JESSE LEAVENS, Palmer Depot, Mass. 22 20t*

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MANUFACTURERS' SUPPLY STORE. The subscribers would call the attention of manufacturers generally, to his stock of articles for the use of factories, both cotton and wollen, consisting of every variety and kind used by them, which he can offer at as fair rates as any other establishment in this or any other market.

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SCRANTON & PARSHLY, New Haven, Conn. have just finished and will sell, to the first who will fork over the cash, 2 splendid side Lathes, 12 feet long, swings 25 in., weighs 2800 pounds, with back and screw gearing—centre follower, rest, drill chuck, and overhead reversing pullies—all complete, price $300. It is a rare chance for those in want of Lathes. Also, 7 of those 8 feet Lathes, a. $125; each. The fact that 5 of them have been sold within the last 10 days, is all that need be said. Send the money aud we will ship to your order. Other Lathes (large 2d lathe excepted) as heretofore advertised in this paper, for sale at low prices as usual. 22 tf

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
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Scientific Museum.

For the Scientific American.

Tanning--Practical Remarks.

(Continued from page 192.)

Tanning is a chemical operation very little understood by most persons engaged in the business. The gelatin of the hide united with the tannin of bark, and other substances, forms a new article, which we call leather. The affinity between the two materials is so great, that when brought in contact they instantly unite. This may be seen by making a solution of glue, (which is the gelatin, or jelly of hides,) and water, and pouring a portion of it into a tumbler of liquor, as used by tanners, —they will unite and sink to the bottom, in that form, useless. I would here remark, that this is a simple and useful test to decide whether the tannin is all exhausted from the liquor, which the tanner would do well to attend to. If there is no tan in the liquor the gelatin will rise to the surface a milky scum. If the tanner in the early stages allows his liquors to become too stale, the jelly will flow from the hide into that liquor, and if that liquor, as is often the case, is pumped into the leeches, the same union takes place—and the tanner finds a slime settled on the top of his bark, in the leech, which he cannot account for, while his liquors are not of the strength he expects. It is the business of the tanner to so unite them as to make them the important article we are describing. Before entering into the process, however, it may be well to describe, more particularly, the material generally used in the United States.

The outer coating of the hemlock, and various species of the oak are the principal. The former for the great body of sole leather—the latter for the various harness and upper leather. The trees are felled in the season when the sap is ascending—from 1st May to 1st September—though usually only from May 15th to August; and the bark is easily peeled off in sheets of any required length, but usually four feet long. It should be suffered to lie with the innner surface exposed to tho sun one or two clear days, to dry up the sap on that surface, when it should be gathered into piles of a square form, in a dry place, on poles above the ground, and be protected by large pieces, laid carefully on the top of the pile. The body only is peeled in America, except the larger branches of the oak; while in England the small limbs, and even twigs, all that will peel, are saved, and thought to be stronger than the body bark. Thirty days of dry weather will cure the bark sufficiently for use. But in a large business it is drawn to a road side, after harvest, snd piled in like manner, and is suffered to remain until fall or winter, when it is drawn into the tannery, and stored in large piles in the open air or in cheap open sheds and taken into the tannery as wanted. At the North this is usually done in winter, which makes good sleighing, almost as important to the tanner as bright skies in June and July. Chemical tests give to hemlock bark only 3¾ to per 6 cent. tannin. American oak not more than half as much. While English hedgerows is 16 per cent. Various other foreign substances contain tannin. Valonia, of Turkey, or the acorn cup and ball, gathered in a green state, is the favorite in England, and it is believed that the great burr oak of the middle states yield, an annual crop of the same material which, if gathered would be sufficient for all the tanning of America—and save the destruction of our noble forests now going on at the north so rapidly. The strongest article known is kutch, imported from the East Indies, evidently an extract boiled down to salts—which contain about 55 per cent. pure tan. It is too expensive for common use in this country, but is much used in England, in liquors for heavy stock. It is computed that for every cord of hemlock bark four trees are peeled, and one cord will tan five hides. If the whole quantity of leather is 1,000,000 sides, 200,000 trees are annually destroyed to furnish the bark.

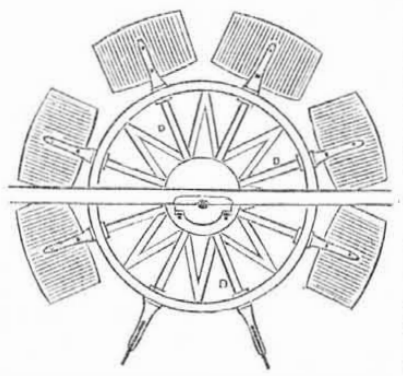
[The next article will take up the subject of making the Liquor Leeches in which it is made.]

History of Propellers and Steam Navigation.

[Continued from page 200.]

More than one plan of different motion, has been devised to make the paddles enter and leave the water in a vertical position. One plan is to make the upper and lower edges change position, and enter the water at a different angles. Another is to turn the side edges, or feather the paddles, which will produce the same effect, but requires a different arrangement of machinery. The plan presented here was the invention of Adolph Heilbron of New York, and was patented in 1829. A revolving motion is given to the paddles, by which they dip into and leave the water as represented in figure 1. The buckets are each fixed upon an arm, which radiates from the centre of the wheel.

Fig. 26.



In a wheel so constructed, the paddles may be made to enter the water edgewise, and be turned so as to act upon it at any point which may be preferred. The paddles which are out of the water are all feathered, or turned edgewise, so as to experience but little resistance from the wind, and to require a very shallow box or casing to protect them on each side of the boat. A wheel of this description may be immersed in water to any depth which may be required, or it may be entirely under water, where the depth is sufficient : should such a mode of fixing it be thought advisable, the progress of the boat will be but little impeded thereby.

One great advantage anticipated from these paddles is, the avoiding of those numerous and perpetual concusions produced by the striking of the water by the ordinary floats, which causes a continued, distressing, and very injurious tremulous motion. They enter by their edges, and are gradual brought into action.

Fig. 27.

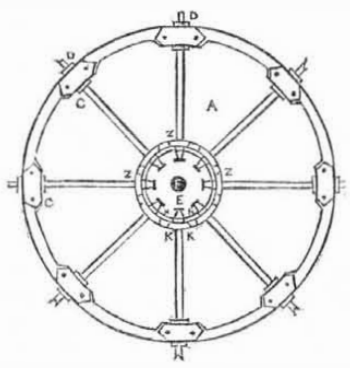


Figure 1 represents one of the said wheels of eight arms or paddles, as it appears when in a finished state, and as applied to the side of a vessel; and figure 2 is a view, on a larger scale, or the central part of the said wheel, as seen from the opposite side, or that nearest to the vessel, for the purpose of showing how the paddle-arms are held and supported in their places, and yet permitted to turn or feather at the proper instant, while the whole wheel turns round. In these several figures A— is a circular disk or plate of cast-iron, having a rim or ring, rising on one side to a sufficient height to give strength and solidity to the said circular plate, and also to take the brasses, C C C, through which the paddle-arms or axis, DDDD, are permitted to turn. The central block of metal E, may be cast in one piece with the disk or plate, but will be better detached, and afterwards fixed to it by screw bolts. The disc or plate, A A— with its centre block E, forms the central part of the paddle-wheel, which must be firmly keyed, or otherwise fixed upon the main shaft, F, which derives its rotary motion from any power applied within the vessel, and this shaft also passes freely through the centre of a metal wiper carriage, which is firmly and immoveably fixed to the side of the vessel, for the purpose of operating upon the wipers or projections, H H, of the paddle axis in order to produce the feathering of the paddles. To effect this, the outer face of the wiper carriage presents two annular surfaces, or eccentric grooves, or one will answer, to make the paddles turn or feather.—

The wipers or projections on the axis of these paddles, are projections of metal, crossing each other so as to project at right angles from the axis of the paddles, and as these wipers come into contact with one or other of the annuallar surfaces, the several paddle axes will each make a quarter turn or revolution. Thus the wipers, Z Z fig. 2, lie with their flat surfaces upon one annualar surface of the wiper carriages, and the inner annualar surface then presents itself, and acts upon the wipers to turn them round; consequently, the inner wipers will now assume the flat position, and will continue in it, until they are again brought by the motion of the wheel, into contact with the ends of the outer annular surface.

For the Scientific American.

Respiration.

Respiration consists in the inspiration and expiration of air: the former is done by raising the ribs and depressing the diaphragm; the latter is effected principally by the elasticity of the ribs and contraction of the muscles of the belly. The whole extent of the air-tubes in man, taken collectively, has been calculated by Hales at about 20,000 square inches, and by Munro at twenty times the surface of the human body. Man respires, on an average, 1000 times in an hour; and, as the amount of air required for each respiration, is twenty-two cubic inches for an adult, about 3,500 gallons are daily brought into contact with the air-tubes, and blood-vessels of the lungs. Experiments have shown that the average amount of carbon given off is about six ounces in twenty-four hours; three individuals, therefore, will evolve carbonic acid containing, at least one pound of carbon. The following estimate will give some idea of the large quantity of carbon consumed by man alone.

	Tons of Carbon consumed daily.	Cub. in. Carbonic acid produced daily.
Boston,	19	5 billions.
New York,	64	17 "
Whole Globe,	126,488	34 "

Accordingly, the annual consumption of carbon, by man alone, may be estimated at about 50,000,000 tons, and the annual production of carbonic acid at 160,000,000 tons.

The volume of oxygen that passes inward exceeds that of the carbonic acid which is expired in the proportion of 1174 to 1000; and nearly 15 per cent. more of oxygen is absorbed by the lungs than is given out in the form of carbonic acid. About 45,000 cubic inches of oxygen are daily consumed by an ordinary man, 40,000 of which go to form the carbonic acid produced during the same period.

In the respiration of vegetables, carbonic acid is absorbed, and, by the agency of light decomposed, assimilating to their own use carbon and evolving oxygen. A necessary equilibrium in the atmosphere is thus maintained by the two great systems of organic nature, animal and vegetable, each counteracting the influence of the other by those processes essential to their nourishment and support.

J. W. G.

Grafting Grape Vines.

Mr. Curtis stated at one of the agricultura meetings in Albany, that he had been successful in grafting the Isabella on the wild grape. He takes about fifteen to eighteen inches of the root of the wild vine, and inserts in it a cleft or "split" grafting. The vine is planted so that the connection of the stock and scion will be just below the surface of the ground.—The operation is performed in the spring before the vines come into leaf.

Cure for Colds.

Three cents' worth of liquorice, three cents' worth of gum arabic; put them in a quart of warm water, simmer them till throughly dissolved; then add three cents' worth of paregoric, and a like puanity of antimonial wine. Let it cool, and sip whenever the cough is troublesome. It is pleasent iufallible, cheap and good. Its cost is fifteen cents.

LITERARY NOTICES.

Specimens of the Stone, Iron, and Timber Bridges &c., &c. of the U. S. Railroads. By George Duggan, Architect, and C. E.—Part III. lies on our table, and we are right glad to see this really great work progressing in a spiritual manner; and to perceive that since the publication of the second part—a month since—the list of subscribers (including the most eminent in the engineering profession, and consequently those most competent to form a correct opinion of the work) has been doubled, still as it will require many hundred suescribers to pay the mere expenses of engraving and printing, we sincerely hope Mr Duggan will be accorded the support and encouragement necessary for the completion of this truly national work, in the manner he contemplates, and has announced, and which we have no doubt—judging by what he has already done—he is fully competent to carry out, with fair encouragement. It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and is specially to the Tiro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil, on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of $9. Part III. contains beautifully executed plans, elevations, sections, and isometrical views of the elegant timber arch, 275 feet span, at Cascade Creek, Pa., on the line of the New York and Erie Railroad; and of a plank bridge 100 feet span, across the Mohawk river, near Rome, on the line of the Utica and Syracuse Railroad, with the estimates, specifications, bills of timber, iron, &c., &c. As we understand, the cost of the work will be raised to $12, or $1 per part, to those who neglect to remit their names and subscriptions before the 1st of May next, we would advise those of our friends and subscribers, who are thinking of taking it, to lose no time, as the subscription list will be closed at the time mentioned, and the names of the patrons and subscribers printed in the body of the work immediately after.

No. 11 of Shakespear's Dramatic Works is now ready, it contains the comedy of "As You Like It," embellished with a fine eugraving of the charming Rosalind. Phillips, Sampson & Co., Publishers, Boston, for sale by Dewitt and Davenport, New York,—price 25 cents.

R. B. Fitts & Co., Boston, have just issued a new and cheap work upon Fowl breeding and rearing; it contains much practical information, and on the whole is the best work for the price that we have seen,—price 25 cents.

Uses and Abuses of Air.—This is a neat volume by Dr. Griscomb, published by J. S. Redfield, Clinton Hall, N. Y., This is a work which should form part of every man's Library. We will have more to say about this book next week.

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